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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,802	03/17/2004	Rudolf W. Gunnerman	020839-001100US	5598
20350 7590 07/02/2007 TOWNSEND AND TOWNSEND AND CREW, LLP TWO EMBARCADERO CENTER EIGHTH FLOOR SAN FRANCISCO, CA 94111-3834			EXAMINER SINGH, PREM C	
			ART UNIT 1764	PAPER NUMBER
			MAIL DATE 07/02/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/803,802	<b>Applicant(s)</b> GUNNERMAN, RUDOLF W.	
	<b>Examiner</b> Prem C. Singh	<b>Art Unit</b> 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Amendment to claim 1 and addition of new claims 8-13 is noted.

### ***Terminal Disclaimer***

2. The terminal disclaimer filed on 05/11/2007 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of co-pending Application 11/059,115 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregoli et al (US Patent 5,110, 443).

6. With respect to claims 1, 8, and 11-13, Gregoli discloses a process for converting heavy hydrocarbons into lighter hydrocarbons. The process comprising:

- (a) forming an oil-in-aqueous phase emulsion;
- (b) feeding the formed emulsion into an ultrasound reactor;
- (c) converting heavy hydrocarbons into lighter hydrocarbons. (Abstract).

Gregoli further discloses, "The hydrocarbons may be any of those hydrocarbons that have been typically termed atmospheric bottoms, vacuum bottoms, vacuum residues, deasphalter bottoms, etc." (Column 2, lines 59-62). "The hydrocarbon crude may be any hydrocarbon and/or hydrocarbon crude, or any fractionated or extracted part(s) thereof, that preferably has a gravity of from about -6 degree API to about 23 degree API." (Column 5, lines 9-13). Gregoli also discloses emulsifying agents consisting of mixtures of fatty acids and compounds with ether linkage (See column 18, lines 49-58, 65-66). Gregoli adds, "The converted mixture leaves the ultrasound reactor means and is processed into or through separation facilities where the upgraded hydrocarbon product (i.e., a lighter hydrocarbon product having a higher API gravity or a lower molecular weight or lower viscosity) is separated." (Column 69, lines 23-28). It is

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to be noted that fatty acids disclosed by Gregoli are liquid aliphatic hydrocarbons with the carbon atoms in the claimed range. Also, compounds with ether linkage will include dialkyl ethers as claimed.

Gregoli invention does not specifically mention about the boiling range of the hydrocarbon used in the process. Since the invention discloses feed as residues with API gravity of -6 to 23, it would have been obvious to one skilled in the art at the time the invention was made to modify Gregoli invention and use temperature range of residues, including the claimed range of 400-800°F, instead of API gravity of the feed because API gravity and temperature range of residues are directly related.

7. With respect to claims 2-4, Gregoli discloses, "The oil-in-water emulsion(s) that are produced contain from about 15% to about 60 % by weight aqueous phase."

(Column 88, lines 40-42). This means that the ratio- (petroleum residuum): (aqueous liquid) = 5.66:1 to 0.66:1.

8. With respect to claims 5 and 6, Gregoli discloses, "The acoustic frequency may range from 10 to 50 kHz." (Column 68, lines 61-62).

Although Gregoli invention does not disclose using frequency in the range of 1 to 100 MHz, it would have been obvious to one skilled in the art at the time the invention was made to modify Gregoli invention and use a higher frequency range, including the claimed range of 1-100 MHz, for a better conversion of residue to lower boiling range products.

9. With respect to claim 7, Gregoli discloses, "The emulsion will be pumped continuously through the reactor chamber at a rate sufficient to yield the desired residence time which may range from 1 second to several minutes." (Column 68, lines 51-54).

10. With respect to claim 9, although Gregoli does not specifically disclose specific gravity of the liquid aliphatic hydrocarbons, this physical property of the liquid hydrocarbon is known to those skilled in the art.

11. With respect to claim 10, although Gregoli does not specifically disclose mineral oil, it would have been obvious to one skilled in the art at the time the invention was made to modify Gregoli invention and use any liquid aliphatic hydrocarbon oil, including mineral oil as claimed, because it is expected that any hydrocarbon oil will be equally effective for the process.

### ***Response to Arguments***

12. Applicant's arguments filed 05/11/2007 have been fully considered but they are not persuasive.

13. The Applicant argues that with the addition to claim 1 of the limitation to liquid aliphatic C15-C20 hydrocarbons and dialkyl ethers, all claims are patentably distinct

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over the disclosure of Gregoli et al. Gregoli et al. require the inclusion of an emulsifying agent that is a long-chain polyether with an aromatic group and a chain of at least four C<sub>2</sub>H<sub>5</sub>O groups. There is no suggestion in Gregoli et al. of the use of liquid aliphatic hydrocarbons, exemplified by mineral oil, or of dialkyl ethers, exemplified by diethyl ether, as emulsion stabilizers.

The Applicant's argument is not persuasive because Gregoli invention does disclose liquid aliphatic hydrocarbons and ether compounds as discussed in the Office action above under claim 1.

14. The Applicant's argument regarding obviousness-type double patenting rejection is persuasive in the light of the Terminal disclosure, and therefore, the rejection under double patenting has been withdrawn.

### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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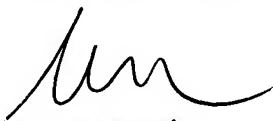
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 7:30 AM-3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PS/062007



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